Marine Biodiversity Records

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DNA barcoding confirms the first record of a *Desmodema polystictum* (Ogilby, 1898) egg and all-time high adult catches in the Indian Ocean

M. I. G. Rathnasuriya[1,2*], A. Mateos-Rivera[3*], A. G. G. C. Bandara[1], R. Skern-Mauritzen[3], R. P. P. K. Jayasinghe[2], J. O. Krakstad[3] and P. Dalpadado[3]

Abstract

The eggs of Polka-dot ribbonfish *Desmodema polystictum* have been recorded for the first time in the Indian Ocean. Although the only previous information on eggs from this species consists of line drawings from 1973 (Pacific Ocean), the identification was possible by combining morphological and molecular analyses. As far as we are aware, only few confirmed records of adult individuals have been previously reported from the Indian Ocean. We found eggs in the proximity of numerous adults (57 and 42 individuals at two stations) indicating that the Central Indian Ocean is potentially an important spawning ground of *D. polystictum*.

Keywords: Central Indian Ocean, COI gene, Fish egg, Mesopelagic fish, Trachipteridae

Background

The ribbonfish family Trachipteridae (Lampriformes) consists of three genera *Trachipterus* (*T. altivelis*, *T. arcticus*, *T. fukuzakii*, *T. ishikawae*, *T. jacksonensis*, *T. trachypterus*), *Desmodema* (*D. lorum*, *D. polystictum*), and *Zu* (*Z. cristatus*, *Z. elongatus*) (Martin 2015; Froese and Pauly 2019). Like most other species in this family, Polka-dot ribbonfish *Desmodema polystictum* (Ogilby, 1898) is distributed circumglobally in tropical and temperate regions (Martin 2015; Angulo and López-Sánchez 2017). However, despite its wide distribution and size, with lengths up to 110 cm, *D. polystictum* is an uncommon, deep dwelling species (Smith-Vaniz 2015). Although the first record of a single specimen of this species (a juvenile) was reported at the end of the twentieth century from the North Indian Ocean (Bauchot and Bianchi 1984), the presence of adults at other locations within the Indian waters were only published very recently (Zacharia and Kannan 2012; Deshmukh et al. 2017). There are few other records only available in reports and online databases. Two records of a single specimen of *D. polystictum* were from the waters of Pakistan in 2010 and 2015 (Fanning et al. 2011; Froese and Pauly 2019). Furthermore, eight individuals of this species have been found off Tanzanian waters (6° 43′ S, 43° 59′ W) in a survey conducted by the R/V Dr. Fridtjof Nansen (Institute of Marine Research (IMR), Norway-database, survey no: 2018405).

The Indian Ocean (Arabian Sea), is viewed as one of the most productive oceans regarding mesopelagic fish (FAO 2001). Until recently, there was comparatively little research activity on the mesopelagic zone worldwide (Hildago and Browman 2019). In the present study, both morphological and molecular approaches, targeting the mitochondrial cytochrome c oxidase 1 (COI) gene (Ward et al. 2009), were used in parallel for identifying a single egg of *D. polystictum* from samples collected in the Indian Ocean. Another egg was identified only based on its morphological characteristics. Furthermore, to identify the possible spawning areas, we explored the spatial overlap of adult fish, based on fieldwork and

* Correspondence: ishara.ruh@gmail.com; alejandro.mateos.rivera@hi.no
[1]Faculty of Fisheries and Ocean Sciences, Ocean University of Sri Lanka, Mahawela Road, Tangalle 82200, Sri Lanka
[2]National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka
[3]Institute of Marine Research (IMR), P O Box 1870 Nordnes, N-5817 Bergen, Norway